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The Relationship between Government Expenditure and Poverty: A Cointegration Analysis

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ABSTRACT

The study examines the long run as well as short run relationship between the fiscal deficits, which is outcome of high government expenditure over the level of tax revenue collection, and poverty. The results reveal a negative relationship between government expenditure and poverty based on time series data from 1976 to 2010. The short run and long run relationships between poverty and other variables are identified by ECM model and Johnson Cointegration test respectively. The results show that there exist short run as well as long run relation between the poverty and government expenditure.

Keywords: Government expenditure, poverty

JEL code: H50, I30

1. Introduction

Government expenditure plays an important role in poverty reduction. According to Keynesian approach, public spending may increase the aggregate demand which further stimulates the economic growth and employment. Many studies show that government spending is positively related with economic growth. While increase in government spending may leads to fiscal deficit. But if government reduces their expenditure it may adversely affect the economy. But the excess of government expenditure due to the current expenses or unproductive use over the taxes collection capacity of economy creates fiscal deficit. Many economists believe that fiscal deficit is the root cause of every illness in the economy. Fiscal deficit can be harmful to welfare for several reasons, such as: it can lead to inefficient allocation of resources and can crowd out the private investment. Further more increases in debt to GDP ratio may have a negative impact on country's long run fiscal sustainability; it might affect the welfare of next

generations. Many studies have found out that there exists a significant statistical relationship between fiscal deficit and many macroeconomic variables. Continuous increase in fiscal deficit creates distortionary effects in the economy. It may cause high inflation, low growth and crowding out of the private investment and consumption in the long run. The afore-mentioned variables further cause the poverty and decrease the welfare in the economy. The financing of fiscal deficit creates severe problem for poverty reduction. In most of the developing countries, fiscal deficit is financed through internal and external borrowing. The internal borrowing affects the interest rate and it crowds out the private investment in the long run. While external borrowing leads to current account deficit and appreciation of exchange rate which further decreases the net export of the country. Although high fiscal deficit is injurious for the economy and it increases poverty but if it increases due to development expenditure it can help reduce poverty in the long run through increase in productivity and employment. In Pakistan government decrease the government expenditure for reducing the fiscal deficit after joining Structural Adjustment Program of IMF which causes to increase poverty due to reduction in subsidies and development expenditures.

Zaidi (2005) stated that during the eighties, poverty in Pakistan decreased due to high economic growth rates along with high remittances, and an active spendthrift public sector. In the nineties, poverty started increasing after joining the IMF's Structural Adjustment Programme which emphasized on the reduction of fiscal deficit through tax increase, cut in development expenditure and reduction or removal of subsidies which are mostly on important inputs of daily life. On the other hand private investment and public sector investment are complementary as the latter pertain to infrastructures; the implications of the decline in public investment on growth are serious. But an increase in fiscal deficit decreases the development expenditure. Kemal (1989)

This study examines the relationship between government expenditure and poverty along with private investment, remittances and secondary school enrollment using as a human capital. The relationship between fiscal policy and poverty reduction in Pakistan is investigated by using Error Correction Model and Jhonson Cointegration Technique. The paper is organized as follows: Section 2 comprises Literature review, section 3 discusses the model specification and methodology, section 4 contains empirical evidences and their interpretations, and finally section 5 gives conclusion.

2. Literature review

Many studies show that government expenditure is positively related with economic growth and poverty reduction but due to high expenditure most of the developing countries are facing the problem of fiscal deficit. Fiscal deficit leads to inflation in the economy. In many developing countries high fiscal deficit crowding out the private investment in the long run and decreases the employment and output which adversely affects the poverty.

Zafar and Mustafa (1998) analyze relationship between macroeconomic variables and economic growth in Pakistan. They have concluded that budget deficit is negatively correlated with the economic growth and output as it considered as a sign of macroeconomic instability. They further concluded that fiscal deficit reduces the output through taxes and current expenditure (civil servant salaries etc) that negatively affect the private sector productivity and it also crowd out the private sector investment as weak credit market performance. Yaya (2010) investigated the causal relationship between budget deficit and economic growth in six countries and found mixed results. In three cases he did not find any casual relationship between budget deficit and growth while in remaining three cases evidence shows that budget deficit adversely effected the growth. Chaudhary and Ahmed (1995) examined the money supply, deficit and inflation relation in case of Pakistan. They concluded that inflation creates poverty through income redistribution. They further stated that the long run relationship between budget deficit and money supply exists. Financing of budget deficit through banking system causes inflation which can be kept under control by reducing the size of budget deficit and step should be taken to boost private investment.

Agha and Khan (2006) have done empirical analysis of fiscal imbalances and inflation in Pakistan. They found out short run as well as long run relationship among money supply, budget deficit and inflation and concluded that the bank borrowing is more inflationary than non bank borrowing. They further concluded that the expansionary fiscal policy increases interest rate and may crowd out private investment and increases inflationary pressure.

Metin (1991) analyzes the empirical relationship between inflation and budget deficit for Turkish economy through multivariate co integration analysis. He found that the scaled budget deficit significantly effects the inflation in Turkey. Catao and Terrones (2003) examined the relationship between fiscal deficit and inflation. A strong positive relationship between fiscal deficit and inflation among high-inflation and developing country group were studied. Soloman and Wet (2004) examined the effect of budget deficit on inflation in Tanzania and found hat economy experienced a high inflation rate accompanied by high fiscal deficit.

Benneth (2007) examined the role of fiscal policy in alleviating poverty in case of Nigeria. He used the general equilibrium model for the study and concluded that the government revenue also positively redistributes income but government expenditures are the important and effective tool of income redistribute and reduction in poverty. He further concluded that the fiscal policy should be formulated in such a way that it redistributes the income from the rich people of the society to poor ones.

Furthermore persistent high inflation rate can affect the sustainability of fiscal deficit. Angelo and Sousa (2009) found association among high inflation rate and large deficit to GDP ratio and deficit instability. As economic growth may increases through government spending. Jamshaid et al (2010) examined the relationship between economic growth and government expenditure,

both at bivariate (aggregate) and multivariate (disaggregate) systems and concluded that economic growth causes government expenditure at bivariate level and also supported that increase in GDP causes growth in government expenditure - Wagner's hypothesis.

Inequality is also an important factor in increasing poverty in developing countries as it adversely effects the economic growth. Many studies found high economic growth accompanied with increasing poverty while some of them also show that in period of low growth poverty reduces. Volker (2005) have done study on Tanzania's growth process and reduction in poverty that how the large scale privatization, liberalization and monetary and fiscal policy affect the poverty through different channel, like private investment and exchange market. He argues that economic reforms and macroeconomic stabilization, resulting in strong growth and low inflation which significantly impact poverty.

Rashid and Amjad (1997) studies the macroeconomic policies and their impact on poverty reduction, founds that the growth above a threshold level of about 5 percent, increase in employment and remittances are the most important variables explaining the change in poverty over time. They also examine those policies under Structural Adjustment Program by IMF increases poverty. Kaldor (1957) and Bourguignon (1981) suggested that greater inequality might lead to growth through capital accumulation. While in contrast modern approaches emphasizes that poor people are unable to invest in human and physical capital with adverse consequences for long run growth on the other hand Forbes (2000) found positive effects of income inequality on growth.

Rizwan and Kemal (2006) studied the relationship between remittances, trade liberalization and poverty in Pakistan in general equilibrium framework. They have used the decomposition approach (rural and urban) and found that all poverty measure in rural and urban shows that decline in remittances increases poverty. They have concluded that the remittances reduction greatly contribute in the poverty of Pakistan. He further concluded that reduction in the remittances and trade liberalization increases the income inequality that increases poverty.

3. Model specification

The aim of this paper is to analyze the long run relationship between the government expenditure and poverty in the presence of controlled variables (Private investment, Secondary school enrollment and Remittances).

$$Pov = f (GE, Pinv, Sse, Rem) \quad (1)$$

The empirical equation is

$$Pov_t = \beta_0 + \beta_1 GE_t + \beta_2 Pinv_t + \beta_3 Sse_t + \beta_4 Rem_t + \xi_t \quad (2)$$

Where:

Pov = Poverty (Poverty head count ratio, Head count ratio of Poverty is used here. $P = Q/N$ where Q= no of poors and N denotes the total population.

GE = Government expenditure as a percentage of GDP (using as a proxy of Budget deficit)

Pinv = Private investment as a percentage of GDP

Sse = Secondary school enrollment (percentage of population)

Rem = Remittances (in log form)

The long run relationship between government expenditure and economic growth will explain how economic growth reduces poverty. Many studies show that remittances plays vital role in reduction in poverty. Secondary school enrolment increases the human capital which reduces the unemployment and less productivity.

Methodology:

In order to avoid the problem created by the unit root, in this paper it is used Augmented Dickey Fuller tests to verify if the variables are stationary. As the data is not stationary we will take the first difference to make it stationary. We further examine the Short run and Long run relationship among variable so we will use ECM and Johnson Cointegration test respectively.

After applying unit root test to each variable it is investigated that all the variables are stationary at first difference so we will apply Johnson co integrating test to find out the Long run relationship between the variables. The null hypothesis of the ADF is that series has unit root.

$$\Delta Y_t = \psi_0 + \delta_t + \psi_1 Y_{t-1} + \beta \Delta Y_{t-1} \quad (3)$$

The above equation indicates the ADF with trend and drift.

Long run co integration test:

For long run relationship we have applied the likelihood ratio test that is based on the maximum eigenvalue and trace statistics of the stochastic matrix of the Johansen (1988) procedure. The necessary condition for Johnson co integration is that all variables should be stationary at same level.

Error Correction Model:

Error correction model is applied to check the short run relationship among the variables. So we will apply the ECM approach to find out the short run relationship between poverty and other variables. So the value of coefficient of μ should be significant and negative that will tell you how far we are from the long run equilibrium that will show the short run equilibrium among the variables.

$$\Delta \text{Pov}_t = \beta_0 + \beta_1 \Delta \text{GE}_t + \beta_2 \Delta \text{Pinv}_t + \beta_3 \Delta \text{Sse}_t + \beta_4 \Delta \text{Rem}_t + \beta_5 \mu_{t-1} + \xi_t \quad (4)$$

Where Δ indicates the first difference of all the variables.

4. Data and empirical evidence

The annual data series between 1976 and 2010 are collected from various issues of Pakistan Economic survey, SBP bulletin and World Development indicators and SPDC reports. Time series have unit root problem. The Augmented Dickey Fuller test (ADF) results in Table 1 suggested that all variables are integrated at first difference.

Table 1 Test for Unit- Root: (ADF with Drift and Trend)

Variables	Level	First Difference
GE	-2.4	-5.9*
POV	-2.238	-8.986*
SSE	0.47	-4.52*
PINV	-1.8	-4.7*
REMT	-0.036	-4.159**

(*) Significant at 1% Level (**) significant at 5% level

All the entire three variables are Non Stationary at level but found Stationary at 1st Difference.

Note: Schwarz information criterion is used to select the optimum lag length

Once the series may be made stationary by using first difference, they can be used in regression analysis by applying the cointegration technique, which shows the long run relationship among the variables. Table 2 suggested that there exist log run relation among variables. Both Maximum eigenvalue and Trace statistics shows five cointegration equation at 5 % level of significance. Table 3 suggested that government expenditure, remittances and secondary school enrolment are significant and having negative signs. While the Private investment have negative sign but it is statistically insignificant. Negative sign of Government expenditure means that there is an inverse relation between government expenditure and poverty. It is suggested that public spend thrift increase the economic activities and output which reduces the poverty. Table 4 shows the results of Error Correction Model (ECM). The negative sign and significance of Error Correction term (EC) indicated that there exist short run relationship between poverty and Government expenditure and takes more than two years to attain equilibrium.

The Derived equation (5) states the long run relationship between poverty and government expenditure along with control variables:

$$Pov_t = -.893GE_t - .039Pinv_t - 4.472Sse_t - .002Rem_t \quad (5)$$

Table 2 Johnson Unrestricted Co-integration Rank Test

Hypothesized No. of CE(s)	Hypothesis	Trace		Max Eigen Statistic	
		Statistic	Critical value	Statistic	Critical value
None *	$H_0: r=0,$ $H_1: r \geq 1$	171.57	69.81	58.56	33.87
At most 1 *	$H_0: r=1,$ $H_1: r \geq 2$	113.01	47.85	51.06	27.58
At most 2 *	$H_0: r=2,$ $H_1: r \geq 3$	61.95	29.79	32.15	21.13
At most 3 *	$H_0: r=3,$ $H_1: r \geq 4$	29.79	15.49	19.15	14.26
At most 4 *	$H_0: r=4,$ $H_1: r \geq 5$	10.64	3.84	10.64	3.84

* denotes rejection of the hypothesis at the 0.05 level

Table 3 Normalized Cointegrating coefficients

Dependent Variable: POV	
GE	- 0.893
SSE	-4.472
REMT	-0.002
PINV	-0.039

Table 4 Error Correction Model

Variables	Coefficient	S. Error	t-Statistic	Prob.
D (GE)	-0.3044	0.1406	-2.1648	0.0394
EC(-1)	-0.3551	0.1636	-2.1706	0.0389

5. Conclusion

Poverty reduces due to increase in public spend thrift and increase in remittances. Government expenditures stimulate the economy in long run through increase in aggregate demand. In this study it is checked that there exists relationship between poverty and government expenditure along with remittances and human capital. Our results suggested that there exist long run relationship among variables. Government expenditure and poverty have inverse relation. The sharp decline in poverty observed after 2002 which may be due to increase in remittances after 9/11 from all over the world. Government expenditure or spending is positively related to economic growth in long run but unfortunately in case of developing countries like Pakistan fiscal or budget balance is achieved through curbing the development expenditures which negatively affect the productivity and economic efficiency of a system.

While on the other hand government expenditure or spending and appropriate source of financing, particular subsidies for specific time period are productive and efficient. It can increase the private investment, job opportunities, human capital through education and health

expenditure reduces poverty. Result too showed a negative relationship between government expenditure and poverty as if expenditures are on the development side like development of social facilities, public utilities, infrastructure, overhead capital generation, health and education so it can reduce poverty in long run. So the real matter of concerned is the composition of government expenditure. But usually the increase in public expenditure causes fiscal deficit which distort economy. Governments take different measure to reduce fiscal imbalances like cut in development expenditure, subsidies and social expenditures etc which affects the welfare. If the reduction in fiscal deficit is a matter of concern then Government can be reduced fiscal deficit by increasing productivity and growth rather reducing expenditure.

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